

## Refine Search

### Search Results -

Terms	Documents
L1 and L28	11

**Database:**

- US Pre-Grant Publication Full-Text Database
- US Patents Full-Text Database
- US OCR Full-Text Database
- EPO Abstracts Database
- JPO Abstracts Database
- Derwent World Patents Index
- IBM Technical Disclosure Bulletins

**Search:**

[]

[]
[]
[]

### Search History

**DATE:** Wednesday, May 19, 2004    [Printable Copy](#)    [Create Case](#)

**Set Name** **Query**

side by side

*DB=USPT; PLUR=YES; OP=OR*

<b>Set Name</b>	<b>Query</b>	<b>Hit Count</b>	<b>Set Name</b>
<u>L29</u>	l1 and L28	11	<u>L29</u>
<u>L28</u>	Aspergillus niger and l14	11759	<u>L28</u>
<u>L27</u>	l1 and L26	7	<u>L27</u>
<u>L26</u>	l14 and streptomyces lividans	2768	<u>L26</u>
<u>L25</u>	L24 and l1	11	<u>L25</u>
<u>L24</u>	l14 and bacillus licheniformis	6178	<u>L24</u>
<u>L23</u>	l14 and bacillus licheniformis	6178	<u>L23</u>
<u>L22</u>	l1 and L21	11	<u>L22</u>
<u>L21</u>	bacillus subtilis and l14	22934	<u>L21</u>
<u>L20</u>	l1 and L19	11	<u>L20</u>
<u>L19</u>	l14 and Saccharomyces cerevisiae	13091	<u>L19</u>
<u>L18</u>	l1 and L17	9	<u>L18</u>
<u>L17</u>	l14 and pichia pastoris	2533	<u>L17</u>
<u>L16</u>	l1 and l14	11	<u>L16</u>

<u>L15</u>	l10 and L14	3	<u>L15</u>
<u>L14</u>	L12 and klebsiella pneumoniae	9019	<u>L14</u>
<u>L13</u>	L12 and klebsiella pneumoniae	9019	<u>L13</u>
<u>L12</u>	L11 and restriction enzyme digest	150116	<u>L12</u>
<u>L11</u>	glycerol dehydratase enzyme	180296	<u>L11</u>
<u>L10</u>	l6 and L9	3	<u>L10</u>
<u>L9</u>	l7 and L8	6	<u>L9</u>
<u>L8</u>	nakamura.in.	13218	<u>L8</u>
<u>L7</u>	nagarajan.in.	193	<u>L7</u>
<u>L6</u>	laffend.in.	4	<u>L6</u>
<u>L5</u>	l3 and l2	3	<u>L5</u>
<u>L4</u>	l1 and L3	11	<u>L4</u>
<u>L3</u>	transformed organism and DNA	131438	<u>L3</u>
<u>L2</u>	(diol or glycerol) near2 (dehydrase or dehydratase)	7	<u>L2</u>
<u>L1</u>	dhab\$ same klebsiella	11	<u>L1</u>

END OF SEARCH HISTORY

## Connecting via Winsock to STN

Welcome to STN International! Enter x:x

LOGINID: ssspta1653hxp

PASSWORD :

TERMINAL (ENTER 1, 2, 3, OR ?):2

Enter NEWS followed by the item number or name to see news on that specific topic.

All use of STN is subject to the provisions of the STN Customer agreement. Please note that this agreement limits use to scientific research. Use for software development or design or implementation of commercial gateways or other similar uses is prohibited and may result in loss of user privileges and other penalties.

FILE 'HOME' ENTERED AT 15:41:29 ON 19 MAY 2004

=> file medline, uspatfull, dgene, embase, wpids, jatio, biobusiness, scisearch, fata, jicst

'FATA' IS NOT A VALID FILE NAME

Enter "HELP FILE NAMES" at an arrow prompt (=>) for a list of files that are available. If you have requested multiple files, you can specify a corrected file name or you can enter "IGNORE" to continue accessing the remaining file names entered.

ENTER A FILE NAME OR (IGNORE):fsta

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.21	0.21

FILE 'MEDLINE' ENTERED AT 15:42:11 ON 19 MAY 2004

FILE 'USPATFULL' ENTERED AT 15:42:11 ON 19 MAY 2004  
CA INDEXING COPYRIGHT (C) 2004 AMERICAN CHEMICAL SOCIETY (ACS)

FILE 'DGENE' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 THOMSON DERWENT

FILE 'EMBASE' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 Elsevier Inc. All rights reserved.

FILE 'WPIDS' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 THOMSON DERWENT

FILE 'JATIO' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 Japanese Patent Office (JPO) - JATIO

FILE 'BIOBUSINESS' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 Biological Abstracts, Inc. (BIOSIS)

FILE 'SCISEARCH' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT 2004 THOMSON ISI

FILE 'FSTA' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 International Food Information Service

FILE 'JICST-EPLUS' ENTERED AT 15:42:11 ON 19 MAY 2004  
COPYRIGHT (C) 2004 Japan Science and Technology Agency (JST)

=> s dhb

=>

=> s dhab?

L1 874 DHAB?

=> s klebsiella pneumoniae and l1

L2 123 KLEBSIELLA PNEUMONIAE AND L1

=> e nakamura,v/au

E1	140	NAKAMURA ZENZO/AU
E2	1	NAKAMURA ZYUN/AU
E3	0	--> NAKAMURA,V/AU
E4	2	NAKAMURAA K/AU
E5	1	NAKAMURAA SHIN/AU
E6	11	NAKAMURACRAIG M/AU
E7	1	NAKAMURAD KOUZOU/AU
E8	1	NAKAMURAI H/AU
E9	1	NAKAMURAIMAJO N/AU
E10	1	NAKAMURAJ S/AU
E11	3	NAKAMURAK/AU
E12	1	NAKAMURAKAMIJO M/AU

=> e laffend,l/au

E1 2 LAFFEND LISA A/AU  
E2 4 LAFFEND LISA ANNE/AU  
E3 0 --> LAFFEND, L/AU  
E4 1 LAFFER B G/AU  
E5 14 LAFFER C/AU  
E6 49 LAFFER C L/AU  
E7 5 LAFFER CHERYL L/AU  
E8 6 LAFFER J/AU  
E9 3 LAFFER J L/AU  
E10 3 LAFFER L L A/AU  
E11 1 LAFFER LEONIE L A/AU  
E12 2 LAFFER M/AU

=> s 12 and digest  
L3 5 L2 AND DIGEST

=> d 13 ti abs ibib tot

L3 ANSWER 1 OF 5 USPATFULL on STN

TI Method for the recombination of genetic elements  
AB A method for the recombination of a gene is disclosed. The method involves the design of unpaired forward and reverse primers having homology to the 5' end of one template and to the 3' end of another template. Short primer extension periods results in a recombined template having paired 5' and 3' ends that can then be amplified. The amplified sample is devoid of any parental template.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:18783 USPATFULL  
TITLE: Method for the recombination of genetic elements  
INVENTOR(S): Milano, Joseph, Claymont, DE, UNITED STATES  
Tang, Xiao-Song, Hockessin, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004014085	A1	20040122
APPLICATION INFO.:	US 2003-374366	A1	20030226 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-360279P	20020226 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	57	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Page(s)	
LINE COUNT:	3857	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 2 OF 5 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer  
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production

of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:225862 USPATFULL  
TITLE: Process for the biological production of 1,3-propanediol with high titer  
INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES  
Haynie, Sharon L., Philadelphia, PA, UNITED STATES  
Laffend, Lisa A., Claymont, DE, UNITED STATES  
Pucci, Jeff P., Pacifica, CA, UNITED STATES  
Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	29	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3915	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 3 OF 5 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer  
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:33323 USPATFULL

TITLE: Process for the biological production of  
 1,3-propanediol with high titer  
 INVENTOR(S): Emptage, Mark, Wilmington, DE, United States  
 Haynie, Sharon L., Philadelphia, PA, United States  
 Laffend, Lisa A., Claymont, DE, United States  
 Pucci, Jeff P., Pacifica, CA, United States  
 Whited, Gregory, Belmont, CA, United States  
 PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,  
 United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6514733	B1	20030204
APPLICATION INFO.:	US 2000-641652		20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Walicka, Malgorzata A	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)	
LINE COUNT:	3730	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 4 OF 5 USPATFULL on STN  
 TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a  
 single microorganism  
 AB A process is provided for the bioconversion of a carbon substrate to  
 1,3-propanediol by a single organism utilizing either microorganisms  
 containing the genes encoding for an active glycerol or diol dehydratase  
 enzyme by contacting these organisms with a carbon substrate under the  
 appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:18270 USPATFULL  
 TITLE: Bioconversion of a fermentable carbon source to  
 1,3-propanediol by a single microorganism  
 INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States  
 Nagarajan, Vasantha, Wilmington, DE, United States  
 Nakamura, Charles Edwin, Claymont, DE, United States  
 PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,  
 United States (U.S. corporation)  
 Genencor International Inc., Palo Alto, CA, United  
 States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6025184		20000215
APPLICATION INFO.:	US 1997-966794		19971110 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Ketter, James		
ASSISTANT EXAMINER:	Yucel, Irem		
NUMBER OF CLAIMS:	4		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1105		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L3 ANSWER 5 OF 5 USPATFULL on STN  
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism  
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active glycerol or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:104308 USPATFULL  
TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism  
INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles Edwin, Claymont, DE, United States  
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5686276		19971111
APPLICATION INFO.:	US 1995-440293		19950512 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Lilling, Herbert J.		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1171		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> d his

(FILE 'HOME' ENTERED AT 15:41:29 ON 19 MAY 2004)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, JAPIO, BIOBUSINESS, SCISEARCH, FSTA, JICST-EPLUS' ENTERED AT 15:42:11 ON 19 MAY 2004

L1 874 S DHAB?  
L2 123 S KLEBSIELLA PNEUMONIAE AND L1  
E NAKAMURA, V/AU  
E LAFFEND, L/AU  
L3 5 S L2 AND DIGEST

=> s l2 and ECORI  
L4 18 L2 AND ECORI

=> d l4 ti abs ibib tot

L4 ANSWER 1 OF 18 USPATFULL on STN  
TI Method for the recombination of genetic elements  
AB A method for the recombination of a gene is disclosed. The method involves the design of unpaired forward and reverse primers having homology to the 5' end of one template and to the 3' end of another template. Short primer extension periods results in a recombined template having paired 5' and 3' ends that can then be amplified. The amplified sample is devoid of any parental template.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2004:18783 USPATFULL  
TITLE: Method for the recombination of genetic elements  
INVENTOR(S): Milano, Joseph, Claymont, DE, UNITED STATES

Tang, Xiao-Song, Hockessin, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2004014085	A1	20040122
APPLICATION INFO.:	US 2003-374366	A1	20030226 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2002-360279P	20020226 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	57	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Page(s)	
LINE COUNT:	3857	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L4 ANSWER 2 OF 18 USPATFULL on STN  
TI Process for the biological production of 1,3-propanediol with high titer  
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes *dhaR*, *orfY*, *dhaT*, *orfX*, *orfW*, *dhaB1*, *dhaB2*, *dhaB3*, and *orfZ*, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (*dhaT*). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2003:225862 USPATFULL  
TITLE: Process for the biological production of 1,3-propanediol with high titer  
INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES  
                  Haynie, Sharon L., Philadelphia, PA, UNITED STATES  
                  Laffend, Lisa A., Claymont, DE, UNITED STATES  
                  Pucci, Jeff P., Pacifica, CA, UNITED STATES  
                  Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	

FILE SEGMENT: APPLICATION  
LEGAL REPRESENTATIVE: E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT  
RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417  
LANCASTER PIKE, WILMINGTON, DE, 19805  
NUMBER OF CLAIMS: 29  
EXEMPLARY CLAIM: 1  
LINE COUNT: 3915  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 3 OF 18 USPATFULL on STN  
TI 1,3-propanediol and polymer derivatives from a fermentable carbon source  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2003:120275 USPATFULL  
TITLE: 1,3-propanediol and polymer derivatives from a fermentable carbon source  
INVENTOR(S): Burch, Robert R., Exton, PA, UNITED STATES  
Dorsch, Robert R., Hockessin, DE, UNITED STATES  
Laffend, Lisa Anne, Claymont, DE, UNITED STATES  
Nagarajan, Vasantha, Wilmington, DE, UNITED STATES  
Nakamura, Charles, Claymont, DE, UNITED STATES

	NUMBER	KIND	DATE
	-----	-----	-----
PATENT INFORMATION:	US 2003082756	A1	20030501
APPLICATION INFO.:	US 2002-213203	A1	20020805 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1999-369796, filed on 6 Aug 1999, GRANTED, Pat. No. US 6428767 Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, GRANTED, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, GRANTED, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Page(s)		
LINE COUNT:	1785		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L4 ANSWER 4 OF 18 USPATFULL on STN  
TI Process for the biological production of 1,3-propanediol with high titer  
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a

dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:33323 USPATFULL  
TITLE: Process for the biological production of 1,3-propanediol with high titer  
INVENTOR(S): Emptage, Mark, Wilmington, DE, United States  
Haynie, Sharon L., Philadelphia, PA, United States  
Laffend, Lisa A., Claymont, DE, United States  
Pucci, Jeff P., Pacifica, CA, United States  
Whited, Gregory, Belmont, CA, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6514733	B1	20030204
APPLICATION INFO.:	US 2000-641652		20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Walicka, Malgorzata A	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)	
LINE COUNT:	3730	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 5 OF 18 USPATFULL on STN  
TI METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources in an organism comprising DNA encoding protein X of a dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:30376 USPATFULL  
TITLE: METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
INVENTOR(S): DUNN-COLEMAN, NIGEL, LOS GATOS, CA, UNITED STATES  
DIAZ-TORRES, MARIA, SAN MATEO, CA, UNITED STATES  
CHASE, MATTHEW W., CHESTERFIELD, MO, UNITED STATES  
TRIMBUR, DONALD, REDWOOD CITY, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003022323	A1	20030130
APPLICATION INFO.:	US 1999-308207	A1	19990513 (9)
	WO 1997-US20873		19971113

DOCUMENT TYPE: Utility  
FILE SEGMENT: APPLICATION

LEGAL REPRESENTATIVE: DEBRA J GLAISTER, GENENCOR INTERNATIONAL INC, 925 PAGE MILL ROAD, PALO ALTO, CA, 94304  
NUMBER OF CLAIMS: 40  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 27 Drawing Page(s)  
LINE COUNT: 4264  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 6 OF 18 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
AB Recombinant organisms are provided comprising genes encoding genes encoding glycerol dehydratase, 1,3-propanediol oxidoreductase, a gene encoding vitamin B.sub.12 receptor precursor(BtuB), a gene encoding vitamin B.sub.12 transport system permease protein(BtuC) and a gene encoding vitamin B.sub.12 transport ATP-binding protein (BtuD). The recombinant microorganism is contacted with a carbon substrate and 1,3-propanediol is isolated from the growth media.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:201883 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
INVENTOR(S): Bulthuis, Ben A., Hoofddorp, NETHERLANDS  
Whited, Gregory M., Belmont, CA, United States  
Trimbur, Donald E., Redwood City, CA, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6432686	B1	20020813
APPLICATION INFO.:	US 1999-307973		19990510 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-85190P	19980512 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Monshipouri, Maryam	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	2037	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 7 OF 18 USPATFULL on STN  
TI Method for identifying the source of carbon in 1,3-propanediol  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:194542 USPATFULL  
TITLE: Method for identifying the source of carbon in

INVENTOR(S) : 1,3-propanediol  
Burch, Robert R., Exton, PA, United States  
Dorsch, Robert R., Hockessin, DE, United States  
Laffend, Lisa Anne, Claymont, DE, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles, Claymont, DE, United States  
E. I. du Pont de Nemours and Company, Wilmington, DE,  
United States (U.S. corporation)  
Genencor International, Inc., Palo Alto, CA, United  
States (U.S. corporation)

PATENT ASSIGNEE(S) :

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6428767	B1	20020806
APPLICATION INFO.:	US 1999-369796		19990806 (9)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, now patented, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Wang, Andrew		
ASSISTANT EXAMINER:	Zara, Jane		
NUMBER OF CLAIMS:	1		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)		
LINE COUNT:	1761		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L4 ANSWER 8 OF 18 USPATFULL on STN  
TI Method for the recombinant production of 1,3-propanediol  
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources in an organism capable of 1,3-propanediol production and comprising DNA encoding protein X of a microorganismal dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3, which proteins are comparable to those encoded by orfY, orfX and orfW, respectively from a microorganismal dha regulon. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2000:142143 USPATFULL  
TITLE: Method for the recombinant production of  
1,3-propanediol  
INVENTOR(S) : Diaz-Torres, Maria, San Mateo, CA, United States  
Dunn-Coleman, Nigel S, Los Gatos, CA, United States  
Chase, Matthew W., Belmont, CA, United States  
Trimbur, Donald, Redwood City, CA, United States  
PATENT ASSIGNEE(S) : Genencor International, Inc., Rochester, NY, United  
States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6136576		20001024
APPLICATION INFO.:	US 1997-969683		19971113 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Nashed, Nashaat T.	

NUMBER OF CLAIMS: 17  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 27 Drawing Figure(s); 27 Drawing Page(s)  
LINE COUNT: 4621  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 9 OF 18 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant microorganisms  
AB Recombinant organisms are provided comprising genes encoding glycerol-3-phosphate dehydrogenase, glycerol-3-phosphatase, glycerol dehydratase and 1,3-propanediol oxidoreductase activites useful for the production of 1,3-propanediol from a variety of carbon substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:4657 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms  
INVENTOR(S): Nakamura, Charles E., Claymont, DE, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
Hsu, Amy Kuang-Hua, Redwood City, CA, United States  
La Reau, Richard D., Mountain View, CA, United States  
Haynie, Sharon L., Philadelphia, PA, United States  
Diaz-Torres, Maria, San Mateo, CA, United States  
Trimbur, Donald E., Redwood City, CA, United States  
Whited, Gregory M., Belmont, CA, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Payne, Mark S., Wilmington, DE, United States  
Picataggio, Stephen K., Landenberg, PA, United States  
Nair, Ramesh V., Wilmington, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6013494		20000111
APPLICATION INFO.:	US 1997-968563		19971112 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Railey, II, Johnny F.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3642	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L4 ANSWER 10 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Novel nucleic acid fragment encoding a non-specific catalytic activity for the bioconversion of 3-hydroxypropionaldehyde to 1,3-propanediol -  
AN AAF81961 DNA DGENE  
AB The present invention an isolated nucleic acid fragment (I) encoding a non-specific catalytic activity for the conversion of 3-hydroxypropionaldehyde to 1,3-propanediol. Also described are: (1) a polypeptide (II) encoded by (I); (2) a chimeric gene (III) comprising (I) operably linked to suitable regulatory sequences; (3) a microorganism (IV) transformed with (III), where (IV) is selected from *Citrobacter*, *Enterobacter*, *Clostridium*, *Klebsiella*, *Aerobacter*, *Lactobacillus*, *Aspergillus*, *Saccharomyces*, *Schizosaccharomyces*, *Zygosaccharomyces*, *Pichia*, *Kluyveromyces*, *Candida*, *Hansenula*, *Debaromyces*, *Mucor*,

Torulopsis, Methylobacter, Salmonella, Bacillus, Streptomyces and Pseudomonas; (4) a recombinant microorganism (V), useful for the production of 1,3-propanediol; (5) a vector pDT29 (VI) comprising a set of genes dhaR, orfY, dhaT, orfX, orfW, **dhaB1**, **dhaB2**, **dhaB3** and orfZ with a 12145 base pair sequence (AAF81961); and (6) a vector pKP32 (VII) comprising dhaR, orfY, orfX, orfW, **dhaB1**, **dhaB2**, **dhaB3** and orfZ with a sequence (AAF81961).

(V) e.g. *Escherichia coli*, is useful for the bioproduction of 1,3-propanediol by contacting (V) with a carbon source, and optionally recovering the 1,3-propanediol produced. A fermentable carbon source can be directly converted to 1,3-propanediol at significantly higher titre resulting in improved economics, and an improved process for the production of 1,3-propanediol from glucose. The present sequence represents a *Klebsiella pneumoniae* pKP1 12/1 kb *EcoRI*-*Sall* DNA fragment, which used in the exemplification of the present invention.

ACCESSION NUMBER: AAF81961 DNA DGENE  
TITLE: Novel nucleic acid fragment encoding a non-specific catalytic activity for the bioconversion of 3-hydroxypropionaldehyde to 1,3-propanediol -  
INVENTOR: Emptage M; Haynie S; Laffend L; Pucci J; Whited G  
PATENT ASSIGNEE: (DUPO) DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 2001012833 A2 20010222 109p  
APPLICATION INFO: WO 2000-US22874 20000818  
PRIORITY INFO: US 1999-149534 19990818  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 2001-307889 [32]  
DESCRIPTION: *Klebsiella pneumoniae* pKP1 12/1 kb  
*EcoRI*-*Sall* DNA fragment SEQ ID NO:1.

L4 ANSWER 11 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
AN AAV42024 DNA DGENE  
AB 2 PCR primers (see AAV42023 and AAV42024) are used to amplify the **dhaB3** gene open reading frame (see AAV42014) of *Klebsiella pneumoniae* from plasmid pHK28-26 (see AAV42022), incorporating a 5' *EcoRI* site and a 3' *XbaI* site. A gene cassette including **dhaB3** was utilised by recombinant *Escherichia coli* in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42024 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO) DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase gamma subunit **dhaB3** PCR primer.

L4 ANSWER 12 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism  
containing cassette comprising specific genes, and capable of using  
inexpensive carbon sources  
AN AAV42023 DNA DGENE  
AB 2 PCR primers (see AAV42023 and AAV42024) are used to amplify the  
dhaB3 gene open reading frame (see AAV42014) of  
*Klebsiella pneumoniae* from plasmid pHK28-26 (see  
AAV42022), incorporating a 5' EcoRI site and a 3' XbaI site. A  
gene cassette including dhaB3 was utilised by recombinant  
Escherichia coli in the conversion of D-glucose to 1,3-propanediol. The  
invention relates to the use of such gene cassettes (see AAV42012-21) for  
the fermentative production of 1,3-propanediol from inexpensive  
C-sources.

ACCESSION NUMBER: AAV42023 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single  
organism containing cassette comprising specific genes, and  
capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D;  
Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S  
K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase gamma subunit dhaB3 PCR  
primer.

L4 ANSWER 13 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism  
containing cassette comprising specific genes, and capable of using  
inexpensive carbon sources  
AN AAV42040 DNA DGENE  
AB 2 PCR primers (see AAV42039 and AAV42040) are used to amplify the  
dhaB1 gene open reading frame (see AAV42012) of  
*Klebsiella pneumoniae* from plasmid pHK28-26 (see  
AAV42022), incorporating a 5' EcoRI site. A gene cassette  
including dhaB2 was utilised by recombinant *Saccharomyces*  
*cerevisiae* in the conversion of D-glucose to 1,3-propanediol. The  
invention relates to the use of such gene cassettes (see AAV42012-21) for  
the fermentative production of 1,3-propanediol from inexpensive  
C-sources.

ACCESSION NUMBER: AAV42040 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single  
organism containing cassette comprising specific genes, and  
capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D;  
Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S  
K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase dhaB1 gene PCR primer.

L4 ANSWER 14 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN

TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
AN AAV42039 DNA DGENE  
AB 2 PCR primers (see AAV42039 and AAV42040) are used to amplify the **dhaB1** gene open reading frame (see AAV42012) of **Klebsiella pneumoniae** from plasmid pHK28-26 (see AAV42022), incorporating a 5' **EcoRI** site. A gene cassette including **dhaB2** was utilised by recombinant *Saccharomyces cerevisiae* in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42039 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase **dhaB1** gene PCR primer.

L4 ANSWER 15 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
AN AAV42038 DNA DGENE  
AB 2 PCR primers (see AAV42037 and AAV42038) are used to amplify the **dhaB2** gene open reading frame (see AAV42013) of **Klebsiella pneumoniae** from plasmid pHK28-26 (see AAV42022), incorporating a 5' **EcoRI** site. A gene cassette including **dhaB2** was utilised by recombinant *Saccharomyces cerevisiae* in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42038 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase **dhaB2** gene PCR primer.

L4 ANSWER 16 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using

AN inexpensive carbon sources  
AAV42037 DNA DGENE  
AB 2 PCR primers (see AAV42037 and AAV42038) are used to amplify the **dhaB2** gene open reading frame (see AAV42013) of **Klebsiella pneumoniae** from plasmid pHK28-26 (see AAV42022), incorporating a 5' **EcoRI** site. A gene cassette including **dhaB2** was utilised by recombinant *Saccharomyces cerevisiae* in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42037 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase **dhaB2** gene PCR primer.

L4 ANSWER 17 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
AN AAV42036 DNA DGENE  
AB 2 PCR primers (see AAV42035 and AAV42036) are used to amplify the **dhaB3** gene open reading frame (see AAV42014) of **Klebsiella pneumoniae** from plasmid pHK28-26 (see AAV42022), incorporating a 5' **EcoRI** site. A gene cassette including **dhaB3** was utilised by recombinant *Saccharomyces cerevisiae* in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42036 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO)DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase **dhaB3** gene PCR primer.

L4 ANSWER 18 OF 18 DGENE COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
AN AAV42035 DNA DGENE

AB 2 PCR primers (see AAV42035 and AAV42036) are used to amplify the **dhaB3** gene open reading frame (see AAV42014) of **Klebsiella pneumoniae** from plasmid pHK28-26 (see AAV42022), incorporating a 5' **EcoRI** site. A gene cassette including **dhaB3** was utilised by recombinant **Saccharomyces cerevisiae** in the conversion of D-glucose to 1,3-propanediol. The invention relates to the use of such gene cassettes (see AAV42012-21) for the fermentative production of 1,3-propanediol from inexpensive C-sources.

ACCESSION NUMBER: AAV42035 DNA DGENE  
TITLE: Fermentative production of 1,3-propanediol - by single organism containing cassette comprising specific genes, and capable of using inexpensive carbon sources  
INVENTOR: Dias-Torres M; Gatenby A A; Haynie S L; Hsu A K; Lareau R D; Nagarajan V; Nair R V; Nakamura C E; Payne M S; Picataggio S K; Trimbur D E; Whited G M  
PATENT ASSIGNEE: (DUPO) DU PONT DE NEMOURS & CO E I.  
(GEMV) GENENCOR INT INC.  
PATENT INFO: WO 9821339 A1 19980522 95p  
APPLICATION INFO: WO 1997-US20292 19971110  
PRIORITY INFO: US 1996-30601 19961113  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
OTHER SOURCE: 1998-297942 [26]  
DESCRIPTION: Glycerol dehydratase **dhaB3** gene PCR primer.

=> d his

(FILE 'HOME' ENTERED AT 15:41:29 ON 19 MAY 2004)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, JAPIO, BIOBUSINESS, SCISEARCH, FSTA, JICST-EPLUS' ENTERED AT 15:42:11 ON 19 MAY 2004

L1 874 S DHAB?  
L2 123 S KLEBSIELLA PNEUMONIAE AND L1  
E NAKAMURA, V/AU  
E LAFFEND, L/AU  
L3 5 S L2 AND DIGEST  
L4 18 S L2 AND ECORI

=> s glycerol dehydratase enzyme  
L5 17 GLYCEROL DEHYDRATASE ENZYME

=> d 15 ti abs ibib tot

L5 ANSWER 1 OF 17 USPATFULL on STN  
TI Methods for producing end-products from carbon substrates  
AB The present invention provides means for the production of desired end-products of in vitro and/or in vivo bioconversion of biomass-based feed stock substrates, including but not limited to such materials as starch and cellulose. In particularly preferred embodiments, the methods of the present invention do not require gelatinization and/or liquefaction of the substrate.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:288696 USPATFULL  
TITLE: Methods for producing end-products from carbon substrates  
INVENTOR(S): Chotani, Gopal K., Cupertino, CA, UNITED STATES  
Kumar, Manoj, Fremont, CA, UNITED STATES  
Pucci, Jeff P., Pacifica, CA, UNITED STATES  
Sanford, Karl J., Cupertino, CA, UNITED STATES  
Shetty, Jayarama K., Pleasanton, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003203454	A1	20031030
APPLICATION INFO.:	US 2003-359771	A1	20030206 (10)
	NUMBER	DATE	
PRIORITY INFORMATION:	US 2002-355260P	20020208 (60)	
	US 2002-355180P	20020208 (60)	
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	KAMRIN T. MACKNIGHT, GENENCOR INTERNATIONAL, INC., 925 PAGE MILL ROAD, PALO ALTO, CA, 94304-1013		
NUMBER OF CLAIMS:	29		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	12	Drawing Page(s)	
LINE COUNT:	2564		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L5 ANSWER 2 OF 17 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer  
 AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:225862 USPATFULL  
 TITLE: Process for the biological production of 1,3-propanediol with high titer  
 INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES  
                   Haynie, Sharon L., Philadelphia, PA, UNITED STATES  
                   Laffend, Lisa A., Claymont, DE, UNITED STATES  
                   Pucci, Jeff P., Pacifica, CA, UNITED STATES  
                   Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417	

LANCASTER PIKE, WILMINGTON, DE, 19805

NUMBER OF CLAIMS:

29

EXEMPLARY CLAIM:

1

LINE COUNT:

3915

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 3 OF 17 USPATFULL on STN

TI 1,3-propanediol and polymer derivatives from a fermentable carbon source  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:120275 USPATFULL

TITLE: 1,3-propanediol and polymer derivatives from a fermentable carbon source

INVENTOR(S): Burch, Robert R., Exton, PA, UNITED STATES  
Dorsch, Robert R., Hockessin, DE, UNITED STATES  
Laffend, Lisa Anne, Claymont, DE, UNITED STATES  
Nagarajan, Vasantha, Wilmington, DE, UNITED STATES  
Nakamura, Charles, Claymont, DE, UNITED STATES

NUMBER KIND DATE

-----

PATENT INFORMATION: US 2003082756 A1 20030501

APPLICATION INFO.: US 2002-213203 A1 20020805 (10)

RELATED APPLN. INFO.: Division of Ser. No. US 1999-369796, filed on 6 Aug 1999, GRANTED, Pat. No. US 6428767 Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, GRANTED, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, GRANTED, Pat. No. US 5686276

DOCUMENT TYPE: Utility

FILE SEGMENT: APPLICATION

LEGAL REPRESENTATIVE: E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805

NUMBER OF CLAIMS: 16

EXEMPLARY CLAIM: 1

NUMBER OF DRAWINGS: 6 Drawing Page(s)

LINE COUNT: 1785

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 4 OF 17 USPATFULL on STN

TI Process for the biological production of 1,3-propanediol with high titer  
AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the Klebsiella pneumoniae dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type Klebsiella pneumoniae. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process

relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:33323 USPATFULL  
TITLE: Process for the biological production of 1,3-propanediol with high titer  
INVENTOR(S): Emptage, Mark, Wilmington, DE, United States  
Haynie, Sharon L., Philadelphia, PA, United States  
Laffend, Lisa A., Claymont, DE, United States  
Pucci, Jeff P., Pacifica, CA, United States  
Whited, Gregory, Belmont, CA, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6514733	B1	20030204
APPLICATION INFO.:	US 2000-641652		20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Walicka, Malgorzata A	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)	
LINE COUNT:	3730	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 5 OF 17 USPATFULL on STN

TI METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources is an organism comprising DNA encoding protein X of a dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:30376 USPATFULL  
TITLE: METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
INVENTOR(S): DUNN-COLEMAN, NIGEL, LOS GATOS, CA, UNITED STATES  
DIAZ-TORRES, MARIA, SAN MATEO, CA, UNITED STATES  
CHASE, MATTHEW W., CHESTERFIELD, MO, UNITED STATES  
TRIMBUR, DONALD, REDWOOD CITY, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003022323	A1	20030130
APPLICATION INFO.:	US 1999-308207	A1	19990513 (9)
	WO 1997-US20873		19971113
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	DEBRA J GLAISTER, GENENCOR INTERNATIONAL INC, 925 PAGE MILL ROAD, PALO ALTO, CA, 94304		
NUMBER OF CLAIMS:	40		
EXEMPLARY CLAIM:	1		

NUMBER OF DRAWINGS: 27 Drawing Page(s)  
LINE COUNT: 4264  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 6 OF 17 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
AB Recombinant organisms are provided comprising genes encoding genes encoding glycerol dehydratase, 1,3-propanediol oxidoreductase, a gene encoding vitamin B.sub.12 receptor precursor(BtuB), a gene encoding vitamin B.sub.12 transport system permease protein(Btuc) and a gene encoding vitamin B.sub.12 transport ATP-binding protein (BtuD). The recombinant microorganism is contacted with a carbon substrate and 1,3-propanediol is isolated from the growth media.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:201883 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
INVENTOR(S): Bulthuis, Ben A., Hoofddorp, NETHERLANDS  
Whited, Gregory M., Belmont, CA, United States  
Tribur, Donald E., Redwood City, CA, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6432686	B1	20020813
APPLICATION INFO.:	US 1999-307973		19990510 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-85190P	19980512 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Monshipouri, Maryam	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	2037	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 7 OF 17 USPATFULL on STN  
TI Method for identifying the source of carbon in 1,3-propanediol  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2002:194542 USPATFULL  
TITLE: Method for identifying the source of carbon in 1,3-propanediol  
INVENTOR(S): Burch, Robert R., Exton, PA, United States  
Dorsch, Robert R., Hockessin, DE, United States  
Laffend, Lisa Anne, Claymont, DE, United States

**PATENT ASSIGNEE(S) :**

Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles, Claymont, DE, United States  
E. I. du Pont de Nemours and Company, Wilmington, DE,  
United States (U.S. corporation)  
Genencor International, Inc., Palo Alto, CA, United  
States (U.S. corporation)

NUMBER	KIND	DATE
--------	------	------

**PATENT INFORMATION:**

US 6428767 B1 20020806

**APPLICATION INFO.:**

US 1999-369796 19990806 (9)

**RELATED APPLN. INFO.:**

Continuation-in-part of Ser. No. US 1997-966794, filed  
on 10 Nov 1997, now patented, Pat. No. US 6025184  
Division of Ser. No. US 1995-440293, filed on 12 May  
1995, now patented, Pat. No. US 5686276

**DOCUMENT TYPE:**

Utility

**FILE SEGMENT:**

GRANTED

**PRIMARY EXAMINER:**

Wang, Andrew

**ASSISTANT EXAMINER:**

Zara, Jane

**NUMBER OF CLAIMS:**

1

**EXEMPLARY CLAIM:**

1

**NUMBER OF DRAWINGS:**

6 Drawing Figure(s); 6 Drawing Page(s)

**LINE COUNT:**

1761

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 8 OF 17 USPATFULL on STN

TI Method for the recombinant production of 1,3-propanediol

AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources in an organism capable of 1,3-propanediol production and comprising DNA encoding protein X of a microorganismal dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3, which proteins are comparable to those encoded by orfY, orfX and orfW, respectively from a microorganismal dha regulon. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:142143 USPATFULL

TITLE: Method for the recombinant production of  
1,3-propanediol

INVENTOR(S) : Diaz-Torres, Maria, San Mateo, CA, United States  
Dunn-Coleman, Nigel S, Los Gatos, CA, United States  
Chase, Matthew W., Belmont, CA, United States  
Trimbur, Donald, Redwood City, CA, United States

PATENT ASSIGNEE(S) : Genencor International, Inc., Rochester, NY, United  
States (U.S. corporation)

NUMBER	KIND	DATE
--------	------	------

**PATENT INFORMATION:**

US 6136576 20001024

**APPLICATION INFO.:**

US 1997-969683 19971113 (8)

NUMBER	DATE
--------	------

**PRIORITY INFORMATION:**

US 1996-30601P 19961113 (60)

**DOCUMENT TYPE:**

Utility

**FILE SEGMENT:**

Granted

**PRIMARY EXAMINER:**

Nashed, Nashaat T.

**NUMBER OF CLAIMS:**

17

**EXEMPLARY CLAIM:**

1

**NUMBER OF DRAWINGS:**

27 Drawing Figure(s); 27 Drawing Page(s)

**LINE COUNT:**

4621

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 9 OF 17 USPATFULL on STN  
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism  
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active glycerol or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:18270 USPATFULL  
TITLE: Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism  
INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles Edwin, Claymont, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)  
Genencor International Inc., Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6025184		20000215
APPLICATION INFO.:	US 1997-966794		19971110 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Ketter, James		
ASSISTANT EXAMINER:	Yucel, Irem		
NUMBER OF CLAIMS:	4		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	1105		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 10 OF 17 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant microorganisms  
AB Recombinant organisms are provided comprising genes encoding glycerol-3-phosphate dehydrogenase, glycerol-3-phosphatase, glycerol dehydratase and 1,3-propanediol oxidoreductase activites useful for the production of 1,3-propanediol from a variety of carbon substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:4657 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms  
INVENTOR(S): Nakamura, Charles E., Claymont, DE, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
Hsu, Amy Kuang-Hua, Redwood City, CA, United States  
La Reau, Richard D., Mountain View, CA, United States  
Haynie, Sharon L., Philadelphia, PA, United States  
Diaz-Torres, Maria, San Mateo, CA, United States  
Trimbur, Donald E., Redwood City, CA, United States  
Whited, Gregory M., Belmont, CA, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Payne, Mark S., Wilmington, DE, United States  
Picataggio, Stephen K., Landenberg, PA, United States  
Nair, Ramesh V., Wilmington, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,

United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6013494		20000111
APPLICATION INFO.:	US 1997-968563		19971112 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Railey, II, Johnny F.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3642	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 11 OF 17 USPATFULL on STN  
TI Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase  
AB A process is provided for the bioconversion of glycerol to 1,3-propanediol in which genes from a bacteria known to possess a diol dehydratase enzyme for 1,2-propanediol degradation are cloned into a bacterial host and the host is grown in the presence of glycerol; expression of the foreign genes in the host cell facilitates the enzymatic conversion of glycerol to 1,3-propanediol which is isolated from the culture.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 1998:124423 USPATFULL  
TITLE: Production of 1,3-propanediol from glycerol by recombinant bacteria expressing recombinant diol dehydratase  
INVENTOR(S): Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles Edwin, Claymont, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5821092		19981013
APPLICATION INFO.:	US 1996-687852		19960726 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1995-440377, filed on 12 May 1995, now patented, Pat. No. US 5633362		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Grimes, Eric		
ASSISTANT EXAMINER:	Nashed, Nashaat T.		
NUMBER OF CLAIMS:	10		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	5 Drawing Figure(s); 4 Drawing Page(s)		
LINE COUNT:	884		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 12 OF 17 USPATFULL on STN  
TI Bioconversion of a fermentable carbon source to 1,3-propanediol by a single microorganism  
AB A process is provided for the bioconversion of a carbon substrate to 1,3-propanediol by a single organism utilizing either microorganisms containing the genes encoding for an active glycerol or diol dehydratase enzyme by contacting these organisms with a carbon substrate under the

appropriate fermentation conditions.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:104308 USPATFULL  
TITLE: Bioconversion of a fermentable carbon source to  
1,3-propanediol by a single microorganism  
INVENTOR(S): Laffend, Lisa Anne, Wilmington, DE, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles Edwin, Claymont, DE, United States  
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, Wilmington, DE,  
United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5686276		19971111
APPLICATION INFO.:	US 1995-440293		19950512 (8)
DOCUMENT TYPE:		Utility	
FILE SEGMENT:		Granted	
PRIMARY EXAMINER:		Lilling, Herbert J.	
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2	Drawing Figure(s); 2 Drawing Page(s)	
LINE COUNT:	1171		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 13 OF 17 USPATFULL on STN  
TI Production of 1,3-propanediol from glycerol by recombinant bacteria  
expressing recombinant diol dehydratase  
AB A process is provided for the bioconversion of glycerol to  
1,3-propanediol in which genes from a bacteria known to possess a diol  
dehydratase enzyme for 1,2-propanediol degradation are cloned into a  
bacterial host and the host is grown in the presence of glycerol;  
expression of the foreign genes in the host cell facilitates the  
enzymatic conversion of glycerol to 1,3-propanediol which is isolated  
from the culture.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:45122 USPATFULL  
TITLE: Production of 1,3-propanediol from glycerol by  
recombinant bacteria expressing recombinant diol  
dehydratase  
INVENTOR(S): Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles E., Claymont, DE, United States  
PATENT ASSIGNEE(S): E. I. Du Pont de Nemours and Company, Wilmington, DE,  
United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5633362		19970527
APPLICATION INFO.:	US 1995-440377		19950512 (8)
DOCUMENT TYPE:		Utility	
FILE SEGMENT:		Granted	
PRIMARY EXAMINER:		Zitomer, Stephanie W.	
ASSISTANT EXAMINER:		Fredman, Jeffrey	
NUMBER OF CLAIMS:	10		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	5	Drawing Figure(s); 4 Drawing Page(s)	
LINE COUNT:	831		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 14 OF 17 USPATFULL on STN  
TI Process for making 1,3-propanediol from carbohydrates using mixed  
microbial cultures  
AB The present invention provides a process for the biotransformation of a

carbohydrate carbon source to 1,3-propanediol using mixed yeast and bacterial cultures wherein the carbohydrate is first fermented to glycerol by the yeast cell and then converted to 1,3-propanediol by the bacterial cell containing an active diol or **glycerol dehydratase enzyme** in this process both the yeast and bacterial cultures are supported on the same carbon source, and 1,3-propanediol is isolated from the media.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 97:9921 USPATFULL  
TITLE: Process for making 1,3-propanediol from carbohydrates using mixed microbial cultures  
INVENTOR(S): Haynie, Sharon L., Philadelphia, PA, United States  
Wagner, Lorraine W., Newark, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5599689		19970204
APPLICATION INFO.:	US 1995-440379		19950512 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Lilling, Herbert J.		
NUMBER OF CLAIMS:	1		
EXEMPLARY CLAIM:	1		
LINE COUNT:	981		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L5 ANSWER 15 OF 17 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
TI 1,3-propanediol monomer useful as feed stock for polymers e.g.  
polypropylene terephthalate, produced by bioconversion of carbon source  
other than glycerol by single microorganism harboring dehydratase enzyme.  
AN 2001-257443 [26] WPIDS  
CR 1996-518684 [51]  
AB WO 200111070 A UPAB: 20030516  
NOVELTY - 1,3-propanediol (PD) produced by contacting a medium containing  
a fermentable carbon substrate other than glycerol or dihydroxyacetone  
with Klebsiella, Citrobacter or a recombinant Escherichia transformed with  
a gene encoding a diol dehydratase or glycerol dehydratase, incubating the  
medium and recovering 1,3-PD from the medium, is new.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(1) a polymer (I) comprising at least two repeating units of  
biosourced 1,3-PD produced by the novel method and selected from  
biosourced 1,3-PD characterized by a delta 13C of -10.74 to -17.02 and a  
fM14C of 1.003-1.232, delta 13C of -13.22 to -14.54 and a fM14C of  
1.106-1.129 and delta 13C of -13.84 to -13.92 and a fM14C of 1.111-1.124;

(2) a polymer (II) comprising at least two repeating units of  
biosourced polypropylene terephthalate comprising 1,3-PD monomer prepared  
by the novel method and selected from a biosourced polypropylene  
terephthalate characterized by delta 13C of -23.76 to -25.85 and a fM14C  
of 0.241-0.373, delta 13C of -24.50 to -25.07 and a fM14C of 0.286-0.326,  
delta 13C of -24.74 to -24.88 and a fM14C of 0.299-0.309 and delta 13C of  
-24.75 to -24.82 and a fM14C of 0.303-0.309;

(3) a co-polymer (III) comprising a blend of two or more polymers, at  
least one of the polymers comprising biosourced 1,3-PD characterized by a  
delta 13C of -13.84 to -13.92 and a fM14C of 1.109-1.126;

(4) an article in the form of a film, fiber, particle, package and a  
molded article comprising 1,3-PD, (I), (II) or (III); and

(5) identifying biosourced 1,3-PD in a sample, by purifying 1,3-PD  
from the sample and characterizing the delta 13C and fM14C of the sample,  
where a delta 13C of -10.9 to -15.4 and a fM14C of 1.04-1.18, indicates a  
biosourced 1,3-PD.

USE - 1,3-PD serves as a new feed stock for useful polymers such as 1,3-PD polyol and polypropylene terephthalate. 1,3-PD and polymers derived from it are useful in the production of polyester fibers and in the manufacture of polyurethanes.

ADVANTAGE - Microorganisms harboring the gene for a dehydratase are capable of converting glucose and other sugars through the glycerol degradation pathway to 1,3-PD with good yields and selectivities. The method can be applied to any carbon substrate that is readily converted to glycerol or dihydroxyacetone.

Dwg. 0/6

ACCESSION NUMBER: 2001-257443 [26] WPIDS  
 CROSS REFERENCE: 1996-518684 [51]  
 DOC. NO. CPI: C2001-077475  
 TITLE: 1,3-propanediol monomer useful as feed stock for polymers e.g. polypropylene terephthalate, produced by bioconversion of carbon source other than glycerol by single microorganism harboring dehydratase enzyme.  
 DERWENT CLASS: A23 D16 E17  
 INVENTOR(S): BURCH, R R; DORSCH, R R; LAFFEND, L A; NAGARAJAN, V; NAKAMURA, C  
 PATENT ASSIGNEE(S): (DUPO) DU PONT DE NEMOURS & CO E I; (BURC-I) BURCH R R; (DORS-I) DORSCH R R; (LAFF-I) LAFFEND L A; (NAGA-I) NAGARAJAN V; (NAKA-I) NAKAMURA C; (GEMV) GENENCOR INT INC  
 COUNTRY COUNT: 30  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 2001011070	A2	20010215 (200126)*	EN 48		
RW: AT BE CH	CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE				
W: BR CA CN	ID IN JP KR MX SG TR				
EP 1222303	A2	20020717 (200254)	EN		
R: AT BE CH	CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE				
US 6428767	B1	20020806 (200254)			
US 2003082756	A1	20030501 (200331)			

#### APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 2001011070	A2	WO 2000-US21459	20000807
EP 1222303	A2	EP 2000-952572	20000807
		WO 2000-US21459	20000807
US 6428767	B1 Div ex	US 1995-440293	19950512
	CIP of	US 1997-966794	19971110
		US 1999-369796	19990806
US 2003082756	A1 Div ex	US 1995-440293	19950512
	CIP of	US 1997-966794	19971110
	Div ex	US 1999-369796	19990806
		US 2002-213203	20020805

#### FILING DETAILS:

PATENT NO	KIND	PATENT NO
EP 1222303	A2 Based on	WO 2001011070
US 6428767	B1 Div ex	US 5686276
	CIP of	US 6025184
US 2003082756	A1 Div ex	US 5686276
	CIP of	US 6025184
	Div ex	US 6428767

PRIORITY APPLN. INFO: US 1999-369796 19990806; US  
 1995-440293 19950512; US

1997-966794 19971110; US  
2002-213203 20020805

L5 ANSWER 16 OF 17 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Production of a monomer which is used in the manufacture of polyester  
fiber, polyurethane and cyclic compounds.

AN 2000-053104 [04] WPIDS

AB WO 9958686 A UPAB: 20000124  
NOVELTY - The monomer, 1,3-propanediol (I), is biologically produced by  
using a transformed host cell (C) comprising at least one copy of gene  
encoding BtuB, BtuC and BtuD.

DETAILED DESCRIPTION - The (I) is produced by the steps comprising:

(1) contacting the transformed (C) with at least one fermentable  
common source and an effective amount of vitamin B12. The transformed (C)  
comprises at least one copy of genes encoding a protein having dehydratase  
activity (a), a protein having an oxidoreductase activity (b), a vitamin  
B12 receptor precursor protein (c), a vitamin B12 transport system  
permease protein (d), and a vitamin B12 transport ATP or GTP-binding  
protein (e); and

(2) recovering (I) produced by (i).

An INDEPENDENT CLAIM is also included for the transformed (C)  
described above.

USE - The method is used to produce (I) (claimed) which is employed  
in the manufacture of polyester fiber, polyurethane and cyclic compounds.

ADVANTAGE - The method produces 1,3-propanediol rapidly and it is  
inexpensive. Increased production of the compound is obtained (E.coli  
strains FM5/pDT24 and FM5/pDT24/pBCDE were cultured and production of  
1,3-propanediol was checked after adding 0.4 mu M coenzyme B12. The latter  
strain showed increased monomer production (e.g. 2.4 g/L but the former  
strain showed 2.0 g/L monomer production))

Dwg.0/0

ACCESSION NUMBER: 2000-053104 [04] WPIDS  
DOC. NO. CPI: C2000-013808  
TITLE: Production of a monomer which is used in the manufacture  
of polyester fiber, polyurethane and cyclic compounds.  
DERWENT CLASS: A41 D16 E17  
INVENTOR(S): BULTHUIS, B; GATENBY, A A; TRIMBUR, D E; WHITED, G M;  
BULTHUIS, B A  
PATENT ASSIGNEE(S): (DUPO) DU PONT DE NEMOURS & CO E I; (GEMV) GENENCOR INT  
INC; (GEMV) GENENCOR INT  
COUNTRY COUNT: 30  
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 9958686	A2	19991118	(200004) * EN	61	
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE					
W: AU BR CA CN ID IL JP KR MX SG US					
AU 9938997	A	19991129	(200018)		
EP 1076708	A2	20010221	(200111) EN		
R: BE CH DE DK ES FR GB IE IT LI NL					
CN 1300321	A	20010620	(200159)		
BR 9910519	A	20010904	(200160)		
KR 2001043531	A	20010525	(200168)		
MX 2000010723	A1	20010501	(200227)		
JP 2002514426	W	20020521	(200236)	78	
US 6432686	B1	20020813	(200255)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 9958686	A2	WO 1999-US10356	19990512
AU 9938997	A	AU 1999-38997	19990512

EP 1076708	A2	EP 1999-921903	19990512
		WO 1999-US10356	19990512
CN 1300321	A	CN 1999-806120	19990512
BR 9910519	A	BR 1999-10519	19990512
		WO 1999-US10356	19990512
KR 2001043531	A	KR 2000-712634	20001111
MX 2000010723	A1	MX 2000-10723	20001031
JP 2002514426	W	WO 1999-US10356	19990512
		JP 2000-548477	19990512
US 6432686	B1 Provisional	US 1998-85190P	19980512
		US 1999-307973	19990510

FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 9938997	A Based on	WO 9958686
EP 1076708	A2 Based on	WO 9958686
BR 9910519	A Based on	WO 9958686
JP 2002514426	W Based on	WO 9958686

PRIORITY APPLN. INFO: US 1998-85190P 19980512; US  
1999-307973 19990510

L5 ANSWER 17 OF 17 WPIDS COPYRIGHT 2004 THOMSON DERWENT on STN  
TI Fermentative production of 1,3-propane-diol useful for polymer production -  
from

carbon substrates using mixed culture of glycerol-producing and  
diol-producing organisms.

AN 1996-518687 [51] WPIDS

AB WO 9635799 A UPAB: 19961219

Production of 1,3-propanediol (I) comprises incubating a carbon substrate with  
a mixed culture of a glycerol-producing organism (A) and a diol producing  
organism (B).

Pref. A) is used at at least 1 million cells/ml and the (A):(B) ratio  
is 0.04-100, pref. 0.4-5.1. The substrate may be mixed with the co-culture  
or fermentation is with (A) first and then with (B). Partic. both  
organisms are used at 10-100 million cells/ml. Fermentation is by batch,  
fed-batch or continuous methods. (A) is an (an)aerobic bacterium, fungus,  
alga or yeast, pref. Aspergillus, Saccharomyces, Zygospacharomyces,  
Pichia, Bacillus, Kluyveromyces, Candida, Hansenula, Dunaliella,  
Debaromyces, Mucor, Torulopsis, Methylobacterium, Escherichia or a  
recombinant cell, especially pref. is S. cerevisiae ATCC 64236. (B) is able to  
produce diol or glycerol dehydratase and is e.g. Citrobacter,  
Enterobacter, Clostridium, Klebsiella, Lactobacillus or a recombinant  
cell, especially Klebsiella, Citrobacter or recombinant E. coli DH5-alpha pKP  
(ATCC 66789) or pKP4 (ATCC 69790).

USE - (I) is useful as a comonomer for fibres and film-forming  
polymers, also as an additive to improve physical properties and  
performance of other substances and articles (no more details).

ADVANTAGE - (I) can now be produced from unrefined carbohydrates,  
without difficulties of catabolite repression, feedback inhibition and  
carbon source diversion.

Dwg.0/0

ABEQ US 5599689 A UPAB: 19970313

A biological process for preparing 1,3-propanediol comprises: (a) mixing a  
glycerol-producing organism at a cell density of at least 1x10<sup>6</sup> cells/ml  
and a diol-producing organism at a cell ratio of glycerol-producing  
organism to diol-producing organism of at least 0.04 to 1.0 to yield a  
mixed culture medium, wherein the glycerol-producing organism is selected  
from the group consisting of members of the genera Aspergillus,  
Saccharomyces, Zygospacharomyces, Pichia, Bacillus, Kluyveromyces, Candida  
sp., Hansenula sp., Dunaliella sp., Debaromyces sp., Mucor, Torulopsis,  
Methylobacterium, Escherichia, and recombinant organisms transformed with

the genes necessary for glycerol production, and wherein the diol-producing organism is selected from the group consisting of members of the genera *Citrobacter*, *Enterobacter*, *Clostridium*, *Klebsiella*, *Lactobacillus*, recombinant organisms transformed with a gene encoding a diol dehydratase enzyme or a **glycerol dehydratase enzyme**, and mutants having phenotypes which enhance production of 1,3-propanediol; (b) contacting the mixed culture medium with a carbon substrate having at least a single carbon atom selected from the group consisting of monosaccharides, oligosaccharides, polysaccharides, carbon dioxide, methanol, formaldehyde, formate, and carbon-containing amines; (c) incubating the mixed culture medium under suitable conditions to produce 1,3-propanediol; and (d) recovering the 1,3-propanediol.

Dwg.0/0

ACCESSION NUMBER: 1996-518687 [51] WPIDS  
 DOC. NO. CPI: C1996-162925  
 TITLE: Fermentative production of 1,3-propane-diol useful for polymer production - from carbon substrates using mixed culture of glycerol-producing and diol-producing organisms.  
 DERWENT CLASS: A41 D16 E17  
 INVENTOR(S): HAYNIE, S L; WAGNER, L W  
 PATENT ASSIGNEE(S): (DUPO) DU PONT DE NEMOURS & CO E I  
 COUNTRY COUNT: 63  
 PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
WO 9635799	A1	19961114 (199651)*	EN	30	
RW: AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG					
W: AL AU BB BG BR CA CN CZ EE GE HU IS JP KP KR LK LR LT LV MD MG MK MN MX NO NZ PL RO SG SI SK TR TT UA US UZ VN					
US 5599689	A	19970204 (199711)		11	
AU 9657228	A	19961129 (199712)			
EP 824595	A1	19980225 (199812)	EN		
R: AT BE CH DE DK ES FI FR GB IE IT LI NL PT SE					
JP 10507082	W	19980714 (199838)		42	
JP 3053436	B2	20000619 (200033)		19	
EP 824595	B1	20011205 (200203)	EN		
R: AT BE CH DE DK ES FI FR GB IE IT LI NL PT SE					
DE 69617672	E	20020117 (200213)			
ES 2165500	T3	20020316 (200227)			

#### APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
WO 9635799	A1	WO 1996-US6161	19960502
US 5599689	A	US 1995-440379	19950512
AU 9657228	A	AU 1996-57228	19960502
EP 824595	A1	EP 1996-915459	19960502
		WO 1996-US6161	19960502
JP 10507082	W	JP 1996-534128	19960502
		WO 1996-US6161	19960502
JP 3053436	B2	JP 1996-534128	19960502
		WO 1996-US6161	19960502
EP 824595	B1	EP 1996-915459	19960502
		WO 1996-US6161	19960502
DE 69617672	E	DE 1996-617672	19960502
		EP 1996-915459	19960502
ES 2165500	T3	WO 1996-US6161	19960502
		EP 1996-915459	19960502

#### FILING DETAILS:

PATENT NO	KIND	PATENT NO
AU 9657228	A Based on	WO 9635799
EP 824595	A1 Based on	WO 9635799
JP 10507082	W Based on	WO 9635799
JP 3053436	B2 Previous Publ. Based on	JP 10507082 WO 9635799
EP 824595	B1 Based on	WO 9635799
DE 69617672	E Based on Based on	EP 824595 WO 9635799
ES 2165500	T3 Based on	EP 824595

PRIORITY APPLN. INFO: US 1995-440379 19950512

=> d his

(FILE 'HOME' ENTERED AT 15:41:29 ON 19 MAY 2004)

FILE 'MEDLINE, USPATFULL, DGENE, EMBASE, WPIDS, JAPIO, BIOBUSINESS, SCISEARCH, FSTA, JICST-EPLUS' ENTERED AT 15:42:11 ON 19 MAY 2004

L1 874 S DHAB?  
 L2 123 S KLEBSIELLA PNEUMONIAE AND L1  
     E NAKAMURA, V/AU  
     E LAFFEND, L/AU  
 L3 5 S L2 AND DIGEST  
 L4 18 S L2 AND ECORI  
 L5 17 S GLYCEROL DEHYDRATASE ENZYME

=> e nagarajan, v/au  
 E1 1 NAGARAJAN VENUGOPALAN/AU  
 E2 1 NAGARAJAN VIJAY G/AU  
 E3 0 --> NAGARAJAN, V/AU  
 E4 1 NAGARAJAPPA C S/AU  
 E5 1 NAGARAJAPPA H/AU  
 E6 2 NAGARAJAPPA N/AU  
 E7 42 NAGARAJARAM H A/AU  
 E8 3 NAGARAJARAM HAMPAPATHALU A/AU  
 E9 1 NAGARAJARAO JAYAKUMAR/AU  
 E10 1 NAGARAJARAO RAMESH MYSORE/AU  
 E11 11 NAGARAJARAO Y/AU  
 E12 1 NAGARAJASHARMA A/AU

=> s transformed organism () Klebsiella pneumoniae  
 L6 0 TRANSFORMED ORGANISM (W) KLEBSIELLA PNEUMONIAE

=> s 15 and encoding DNA  
 L7 0 L5 AND ENCODING DNA

=> s 15 and DNA  
 L8 14 L5 AND DNA

=> s 18 and ECORI  
 L9 8 L8 AND ECORI

=> d 19 ti abs ibib tot

L9 ANSWER 1 OF 8 USPATFULL on STN  
 TI Process for the biological production of 1,3-propanediol with high titer  
 AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is

achieved by the use of an *E. coli* transformed with the *Klebsiella pneumoniae* dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type *Klebsiella pneumoniae*. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant *E. coli* containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in *E. coli* of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:225862 USPATFULL  
TITLE: Process for the biological production of 1,3-propanediol with high titer  
INVENTOR(S): Emptage, Mark, Wilmington, DE, UNITED STATES  
Haynie, Sharon L., Philadelphia, PA, UNITED STATES  
Laffend, Lisa A., Claymont, DE, UNITED STATES  
Pucci, Jeff P., Pacifica, CA, UNITED STATES  
Whited, Gregory Marshall, Belmont, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003157674	A1	20030821
APPLICATION INFO.:	US 2002-277249	A1	20021021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2000-641652, filed on 18 Aug 2000, PENDING		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	29	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3915	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 2 OF 8 USPATFULL on STN  
TI 1,3-propanediol and polymer derivatives from a fermentable carbon source  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2003:120275 USPATFULL  
TITLE: 1,3-propanediol and polymer derivatives from a fermentable carbon source  
INVENTOR(S): Burch, Robert R., Exton, PA, UNITED STATES  
Dorsch, Robert R., Hockessin, DE, UNITED STATES  
Laffend, Lisa Anne, Claymont, DE, UNITED STATES  
Nagarajan, Vasantha, Wilmington, DE, UNITED STATES  
Nakamura, Charles, Claymont, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003082756	A1	20030501
APPLICATION INFO.:	US 2002-213203	A1	20020805 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 1999-369796, filed on 6 Aug 1999, GRANTED, Pat. No. US 6428767 Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, GRANTED, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, GRANTED, Pat. No. US 5686276		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Page(s)		
LINE COUNT:	1785		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L9 ANSWER 3 OF 8 USPATFULL on STN  
 TI Process for the biological production of 1,3-propanediol with high titer  
 AB The present invention provides an improved method for the biological production of 1,3-propanediol from a fermentable carbon source in a single microorganism. In one aspect of the present invention, an improved process for the conversion of glucose to 1,3-propanediol is achieved by the use of an E. coli transformed with the Klebsiella pneumoniae dha regulon genes dhaR, orfY, dhaT, orfX, orfW, dhaB1, dhaB2, dhaB3, and orfZ, all these genes arranged in the same genetic organization as found in wild type Klebsiella pneumoniae. In another aspect of the present invention, an improved process for the production of 1,3-propanediol from glucose using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, and a dehydratase reactivation factor compared to an identical process using a recombinant E. coli containing genes encoding a G3PDH, a G3P phosphatase, a dehydratase, a dehydratase reactivation factor and a 1,3-propanediol oxidoreductase (dhaT). The dramatically improved process relies on the presence in E. coli of a gene encoding a non-specific catalytic activity sufficient to convert 3-hydroxypropionaldehyde to 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
 ACCESSION NUMBER: 2003:33323 USPATFULL  
 TITLE: Process for the biological production of 1,3-propanediol with high titer  
 INVENTOR(S): Emptage, Mark, Wilmington, DE, United States  
                   Haynie, Sharon L., Philadelphia, PA, United States  
                   Laffend, Lisa A., Claymont, DE, United States  
                   Pucci, Jeff P., Pacifica, CA, United States  
                   Whited, Gregory, Belmont, CA, United States  
 PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6514733	B1	20030204
APPLICATION INFO.:	US 2000-641652		20000818 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-149534P	19990818 (60)
DOCUMENT TYPE:	Utility	

FILE SEGMENT: GRANTED  
PRIMARY EXAMINER: Prouty, Rebecca E.  
ASSISTANT EXAMINER: Walicka, Malgorzata A  
NUMBER OF CLAIMS: 6  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 6 Drawing Figure(s); 6 Drawing Page(s)  
LINE COUNT: 3730  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 4 OF 8 USPATFULL on STN  
TI METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources is an organism comprising DNA encoding protein X of a dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2003:30376 USPATFULL  
TITLE: METHOD FOR THE RECOMBINANT PRODUCTION OF 1,3-PROPANEDIOL  
INVENTOR(S): DUNN-COLEMAN, NIGEL, LOS GATOS, CA, UNITED STATES  
DIAZ-TORRES, MARIA, SAN MATEO, CA, UNITED STATES  
CHASE, MATTHEW W., CHESTERFIELD, MO, UNITED STATES  
TRIMBUR, DONALD, REDWOOD CITY, CA, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2003022323	A1	20030130
APPLICATION INFO.:	US 1999-308207	A1	19990513 (9)
	WO 1997-US20873		19971113
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	DEBRA J GLAISTER, GENENCOR INTERNATIONAL INC, 925 PAGE MILL ROAD, PALO ALTO, CA, 94304		
NUMBER OF CLAIMS:	40		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	27 Drawing Page(s)		
LINE COUNT:	4264		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L9 ANSWER 5 OF 8 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
AB Recombinant organisms are provided comprising genes encoding genes encoding glycerol dehydratase, 1,3-propanediol oxidoreductase, a gene encoding vitamin B.sub.12 receptor precursor(BtuB), a gene encoding vitamin B.sub.12 transport system permease protein(Btuc) and a gene encoding vitamin B.sub.12 transport ATP-binding protein (BtuD). The recombinant microorganism is contacted with a carbon substrate and 1,3-propanediol is isolated from the growth media.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2002:201883 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant organisms comprising genes for vitamin B12 transport  
INVENTOR(S): Bulthuis, Ben A., Hoofddorp, NETHERLANDS  
Whited, Gregory M., Belmont, CA, United States  
Trimbur, Donald E., Redwood City, CA, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
PATENT ASSIGNEE(S): E. I. du Pont de Nemours and Company, Wilmington, DE,

United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6432686	B1	20020813
APPLICATION INFO.:	US 1999-307973		19990510 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-85190P	19980512 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Prouty, Rebecca E.	
ASSISTANT EXAMINER:	Monshipouri, Maryam	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	2037	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		

L9 ANSWER 6 OF 8 USPATFULL on STN  
TI Method for identifying the source of carbon in 1,3-propanediol  
AB A new polypropylene terephthalate composition is provided. The polypropylene terephthalate is comprised of 1,3-propanediol and terephthalate. The 1,3-propanediol is produced by the bioconversion of a fermentable carbon source, preferable glucose. The resulting polypropylene terephthalate is distinguished from petrochemically produced polymer on the basis of dual carbon-isotopic fingerprinting which indicates both the source and the age of the carbon.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2002:194542 USPATFULL  
TITLE: Method for identifying the source of carbon in 1,3-propanediol  
INVENTOR(S): Burch, Robert R., Exton, PA, United States  
Dorsch, Robert R., Hockessin, DE, United States  
Laffend, Lisa Anne, Claymont, DE, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Nakamura, Charles, Claymont, DE, United States  
E. I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S. corporation)  
Genencor International, Inc., Palo Alto, CA, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6428767	B1	20020806
APPLICATION INFO.:	US 1999-369796		19990806 (9)
RELATED APPLN. INFO.:			Continuation-in-part of Ser. No. US 1997-966794, filed on 10 Nov 1997, now patented, Pat. No. US 6025184 Division of Ser. No. US 1995-440293, filed on 12 May 1995, now patented, Pat. No. US 5686276
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Wang, Andrew		
ASSISTANT EXAMINER:	Zara, Jane		
NUMBER OF CLAIMS:	1		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 6 Drawing Page(s)		
LINE COUNT:	1761		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

L9 ANSWER 7 OF 8 USPATFULL on STN  
TI Method for the recombinant production of 1,3-propanediol  
AB The present invention provides an improved method for the production of 1,3-propanediol from a variety of carbon sources in an organism capable of 1,3-propanediol production and comprising DNA encoding protein X of a microorganismal dehydratase or protein X in combination with at least one of protein 1, protein 2 and protein 3, which proteins are comparable to those encoded by orfY, orfX and orfW, respectively from a microorganismal dha regulon. The protein X may be isolated from a diol dehydratase or a glycerol dehydratase. The present invention also provides host cells comprising protein X that are capable of increased production of 1,3-propanediol.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

ACCESSION NUMBER: 2000:142143 USPATFULL  
TITLE: Method for the recombinant production of 1,3-propanediol  
INVENTOR(S): Diaz-Torres, Maria, San Mateo, CA, United States  
Dunn-Coleman, Nigel S, Los Gatos, CA, United States  
Chase, Matthew W., Belmont, CA, United States  
Trimbur, Donald, Redwood City, CA, United States  
PATENT ASSIGNEE(S): Genencor International, Inc., Rochester, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6136576		20001024
APPLICATION INFO.:	US 1997-969683		19971113 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Nashed, Nashaat T.	
NUMBER OF CLAIMS:	17	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	27 Drawing Figure(s); 27 Drawing Page(s)	
LINE COUNT:	4621	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 8 OF 8 USPATFULL on STN  
TI Method for the production of 1,3-propanediol by recombinant microorganisms  
AB Recombinant organisms are provided comprising genes encoding glycerol-3-phosphate dehydrogenase, glycerol-3-phosphatase, glycerol dehydratase and 1,3-propanediol oxidoreductase activites useful for the production of 1,3-propanediol from a variety of carbon substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
ACCESSION NUMBER: 2000:4657 USPATFULL  
TITLE: Method for the production of 1,3-propanediol by recombinant microorganisms  
INVENTOR(S): Nakamura, Charles E., Claymont, DE, United States  
Gatenby, Anthony A., Wilmington, DE, United States  
Hsu, Amy Kuang-Hua, Redwood City, CA, United States  
La Reau, Richard D., Mountain View, CA, United States  
Haynie, Sharon L., Philadelphia, PA, United States  
Diaz-Torres, Maria, San Mateo, CA, United States  
Trimbur, Donald E., Redwood City, CA, United States  
Whited, Gregory M., Belmont, CA, United States  
Nagarajan, Vasantha, Wilmington, DE, United States  
Payne, Mark S., Wilmington, DE, United States  
Picataggio, Stephen K., Landenberg, PA, United States

PATENT ASSIGNEE(S) : Nair, Ramesh V., Wilmington, DE, United States  
E. I. du Pont de Nemours and Company, Wilmington, DE,  
United States (U.S. corporation)  
Genencor International, Palo Alto, CA, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6013494		20000111
APPLICATION INFO.:	US 1997-968563		19971112 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30601P	19961113 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Railey, II, Johnny F.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3642	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		